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1: EMBO J 1992 Oct;11(10):3521-31

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**A mammalian dual specificity protein kinase, Nek1, is related to the NIMA cell cycle regulator and highly expressed in meiotic germ cells.**

**Letwin K, Mizzen L, Motro B, Ben-David Y, Bernstein A, Pawson T.**

Division of Molecular and Developmental Biology, Samuel Lunenfeld Research Institute, Mount Sinai Hospital, Toronto, Ontario, Canada.

Screening of mouse cDNA expression libraries with antibodies to phosphotyrosine resulted in repeated isolation of cDNAs that encode a novel mammalian protein kinase of 774 amino acids, termed Nek1. Nek1 contains: N-terminal protein kinase domain which is most similar (42% identity) to the catalytic domain of NIMA, a protein kinase which controls initiation of mitosis in *Aspergillus nidulans*. In addition, both Nek1 and NIMA have a long, basic C-terminal extension, and are therefore similar in overall structure. Despite its identification with anti-phosphotyrosine antibodies, Nek1 contain sequence motifs characteristic of protein serine/threonine kinases. The Nek1 kinase domain, when expressed in bacteria, phosphorylated exogenous substrates primarily on serine/threonine, but also on tyrosine, indicating that Nek1 is a dual specificity kinase with the capacity to phosphorylate all three hydroxyamino acids. Like NIMA, Nek1 preferentially phosphorylated beta-casein in vitro. In situ RNA analysis of nek1 expression in mouse gonads revealed a high level of expression in both male and female germ cells, with distribution consistent with a role in meiosis. These results suggest that Nek1 is a mammalian relative of the fungal NIMA cell cycle regulator.

PMID: 1382974 [PubMed - indexed for MEDLINE]

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